TM 11-6625-406-12

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

OPERATOR AND ORGANIZATIONAL
MAINTENANCE MANUAL

SIGNAL GENERATOR SG-336/U

HEADQUARTERS, DEPARTMENT OF THE ARMY

OCTOBER 1961

AGO 1967A

WARNING

Be careful when working on the 117-volt ac line connections.
Serious injury or death may result from contact with these terminals.

DON'T TAKE CHANCES!

GPO 822—605—1

TECHNICAL MANUAL
No. 11-6625-406-12

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., *6 October 1961*

OPERATOR AND ORGANIZATIONAL MAINTENANCE MANUAL

SIGNAL GENERATOR SET SG-336/U

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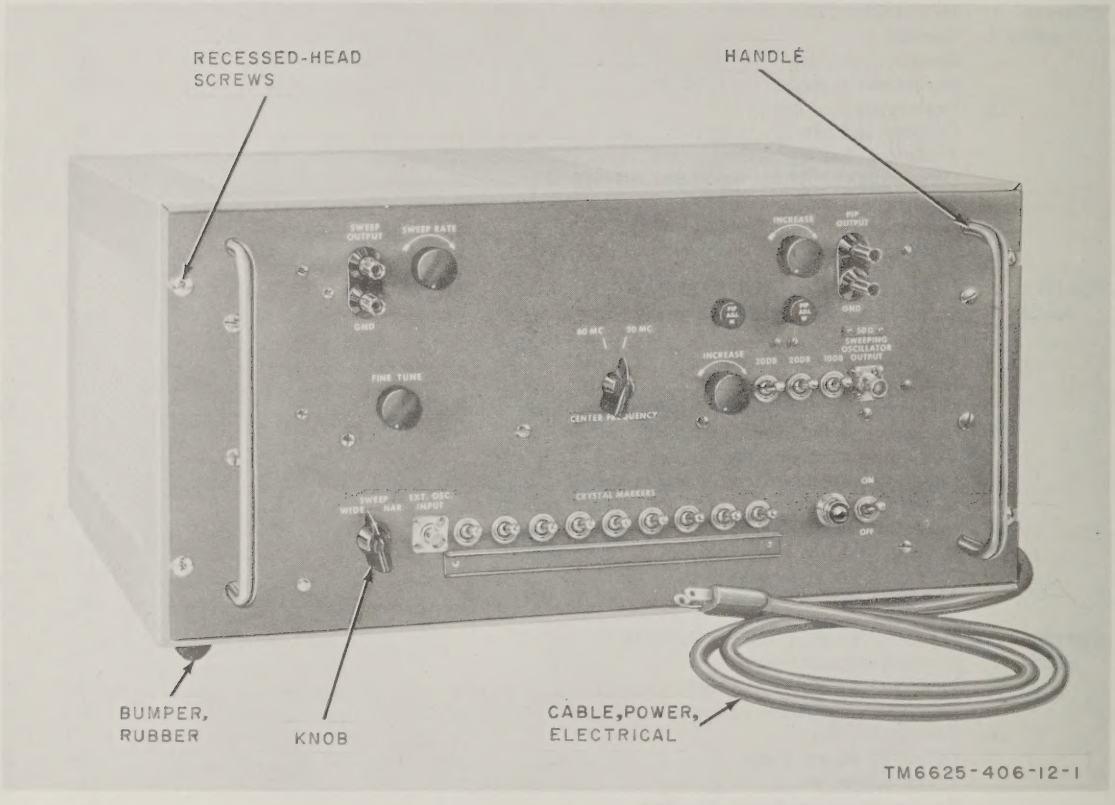

Figure 1. Signal Generator SG–336/U.

CHAPTER 1
INTRODUCTION

Section I. GENERAL

1. Scope

This manual describe Signal Generator SG–336U and covers its installation, operation, operator's maintenance, and organizational maintenance. It includes operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to first and second echelon maintenance.

2. Forms and Records

a. Unsatisfactory Equipment Reports. Fill out and forward DA Form 468 (Unsatisfactory Equipment Report) to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS-MLM, Fort Monmouth, N.J., as prescribed in AR 700–38.

b. Report of Damaged or Improper Shipment. Fill out and forward DD Form 6 (Report of Damaged or Improper Shipment) as prescribed in AR 700–58.

c. Preventive Maintenance Form. Prepare DA Form 11–266 (Maintenance Check List for Signal Equipment (Test Equipment)) (figs. 7 and 8) in accordance with instructions on the form.

d. Parts List Form. Forward DA Form 2028 (Recommended Changes to DA Technical Manual Parts Lists or Supply Manual 7, 8, or 9) direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–MLM, Fort Monmouth, N.J., with comments on parts listings.

e. Comments on manual. Forward all other comments on this publication direct to the Commanding Officer, U.S. Army Signal Materiel Support Agency, ATTN: SIGMS–PA2d, Fort Monmouth, N.J.

Section II. DESCRIPTION AND DATA

3. Purpose and Use

a. Signal Generator SG–336/U is a portable, wide-band sweeping oscillator with crystal-controlled, pulse-type frequency markers. It provides frequency-swept radiofrequency (RF) voltages used for testing, aligning, and repairing radar intermediate frequency circuits. When used with an oscilloscope, it provides a pictorial representation of the frequency response characteristics of amplifiers, filters, and similar circuits.

b. Either a 30-megacycle (mc) or a 60-mc center frequency can be selected, and a sweep width (frequency deviation) of 20 mc or 3 mc can be selected. The 3-mc sweep width is variable over the center 50 percent of each band.

c. Pulse-type fixed frequency markers are provided at 27.5 mc, 28.5 mc, 30 mc, 31.5 mc, and 32.5 mc. Provisions are included for up to four additional fixed marker frequencies.

d. When used in conjunction with an external continuous-wave (cw) oscillator, the signal generator provides a continously variable frequency marker within 20- to 40-mc (30-mc center frequency) and 50- to 70-mc (60-mc center frequency) ranges.

4. Technical Characteristics

Sweeping frequency output:
Center frequency ..... 30 mc and 60 mc.
Sweep width:

Width	20 mc.
Narrow	3 mc, variable over center 50 percent of each band.
Voltage	250 millivolts rms, maximum.
Impedance	50 ohms, nominal.
Level controls	Additive, switchable attenuators of 10 db, 20 db, and 20 db, plus variable attenuator of 6 db. Maximum attenuation is 56 db.
Amplitude modulation while sweeping	Less than 0.05 db per mc.
Markers:	
Fixed frequencies	Five, crystal-controlled, at 27.5 mc, 28.5 mc, 30 mc. 31.5 mc, and 32.5 mc. Provisions are included for up to four additional marker frequencies.
Variable frequency	External cw oscillator with minimum output of 0.1 volt rms may be used to provide a continuously variable marker within 20 to 40 mc, and 50 to 70 mc ranges.
Output voltage	Positive pulse, 10 volts peak to peak.
Sweep Output:	
Wave shape	Sawtooth, locked to line frequency, variable around this frequency.
Amplitude	7.0 volts (approximately).
Line-voltage input	117 volts ±11.7, 50 to 60 cycles.
Power consumption	100 watts (approximately).
Number of tubes	11.
Weight	36 pounds.

5. Components of Signal Generator SG–336/U

a. Components.

Quantity	Item	Height (in.)	Depth (in.)	Width (in.)	Unit weight (lb)
1	Signal Generator SG–336/U	9⅛	13	19½	36
2	TM 11–6625–406–12.				
1 set	Running spares (*b* below).				

b. Running Spares.

Quantity	Item	Identification
1	Electron tube, 6J6	V1 OSC
1	Electron tube, 6V6	V2 OSC
1	Electron tube, 6SN7	V3 OSC
3	Electron tube, 12AT7	V4, V6, V7 OSC
1	Electron tube, 12AU7	V5 OSC
1	Electron tube, 5Y3	V1 PS
1	Electron tube, 6Y6	V2 PS
1	Electron tube, 6SL7	V3 PS
1	Electron tube, VR150/OD3	V4 PS
6	Fuse, 3-ampere	F1
1	Pilot lamp, 0.25 ampere, 6.3-volt	I1

6. Common Name

Thoroughout the manual, Signal Generator SG–336/U is referred to as the signal generator.

7. Description of Signal Generator (fig. 1)

The signal generator consists of two chassis, a power supply chassis and a frequency-generating chassis, enclosed in a metal cabinet. Attached to the front panel are two metal handles to aid in removal of the slide-out chassis from the cabinet. The line fuseholder, mounted on the rear panel, permits fuse replacement without removal of the chassis from the cabinet. The alternating-current (ac) power cable is permanently attached to the rear panel and terminates in a 2-power prong. Cord CG–409/U can be fabricated from RG–58/U coaxial cable and UG–88/U connectors if the CG–409/U is not available. This coaxial cable will be used for all coaxial connections made from the signal generator. The tubes of the frequency-generating chassis receive operating power

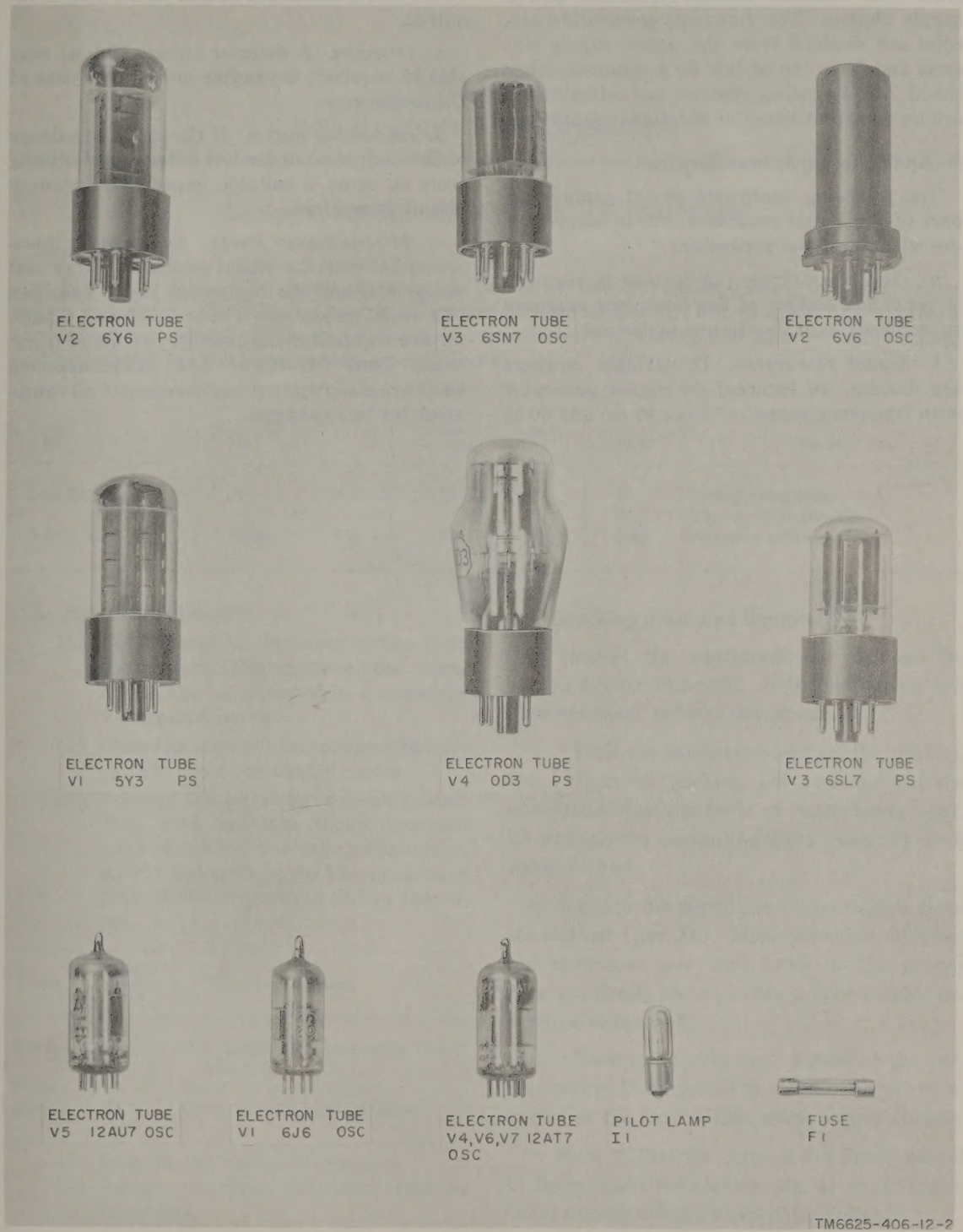

Figure 2. Running spares.

from the internal, voltage-regulated, power supply chassis. The frequency-generating circuits are shielded from the power supply circuits and from the ac line by a complete inner shield. All operating controls and adjustments are on the front panel of the signal generator.

8. Additional Equipment Required

The following equipment is not supplied as part of the signal generator, but is needed for use with the signal generator:

a. Oscilloscope. An oscilloscope is required to provide a display of the frequency response characteristics of the circuits under test.

b. Signal Generator. If variable markers are desired, an external cw signal generator with frequency ranges of 20 to 40 mc and 50 to 70 mc and a minimum output of 0.1 volt is required.

c. Detector. A detector circuit (fig. 6) may also be required, depending on the bandpass of the oscilloscope.

d. Impedance Match. If the input impedance of the equipment under test differs substantially from 50 ohms, a suitable impedance matching circuit is required.

e. Miscellaneous Parts. To prevent interaction between the signal generator, other test equipment, and the equipment under test, two 47K resistors and one 0.001-microfarad capacitor are required if the detector in *c* above is not used. Cord CG–409/U and interconnecting leads are also required to interconnect all equipment for test purposes.

CHAPTER 2
INSTALLATION AND OPERATION

Section I. SERVICE UPON RECEIPT OF EQUIPMENT

9. Unpacking

a. Packaging Data. The signal generator is packed in one corrugated carton for shipment as shown in figure 3. The running spares, which are shipped separately, are wrapped in a moisture-vaporproof barrier and placed in a corrugated carton lined with corrugated filler. The dimensions and contents of the shipping cartons are as follows:

Box No.	Dimensions (in.)			Volume (cu ft)	Volume (lb)	Qty	Contents
1 of 2	23	19	15	4.79	45	1 2	Signal generator. TM 11-6625-406-12.
2 of 2	9	6½	6½	0.23	1½	1 set	Running spares.

b. Removing Contents.

(1) Cut the tape on the outer carton, open the carton, and remove the inner carton that is wrapped in a moisture-vaporproof barrier.

(2) Open the moisture-vaporproof barrier and the inner corrugated carton.

(3) Remove the humidity indicator card. This card contains three desiccant spots which are normally colored blue. At 77° Fahrenheit, the blue spots turn pink at the following relative humidity.

Spot	Relative humidity (%)	Comment
Top	65	Dry equipment thoroughly before operating.
Middle	40	Check for condensation.
Bottom	30	Check equipment for mildew.

(4) Remove the technical manuals.

(5) Remove the signal generator from the inner box.

10. Checking Unpacked Equipment

a. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, refer to paragraph 2.

b. Check the equipment against the packing list. When no packing list accompanies the equipment, use the table of components (par. 5) and/or the packaging data (par. 9) as a general check.

c. Remove the signal generator chassis from the cabinet (par. 11). Make sure that all tubes are unbroken, and that tubes of the proper type are firmly seated in the proper sockets according to figure 4.

d. Check to be sure that a fuse of the correct rating (3 amperes) is installed in the fuseholder at the rear of the power supply chassis.

e. Be sure that the crystals are firmly seated in their respective sockets (fig. 4) according to the stamping and the chart listed below.

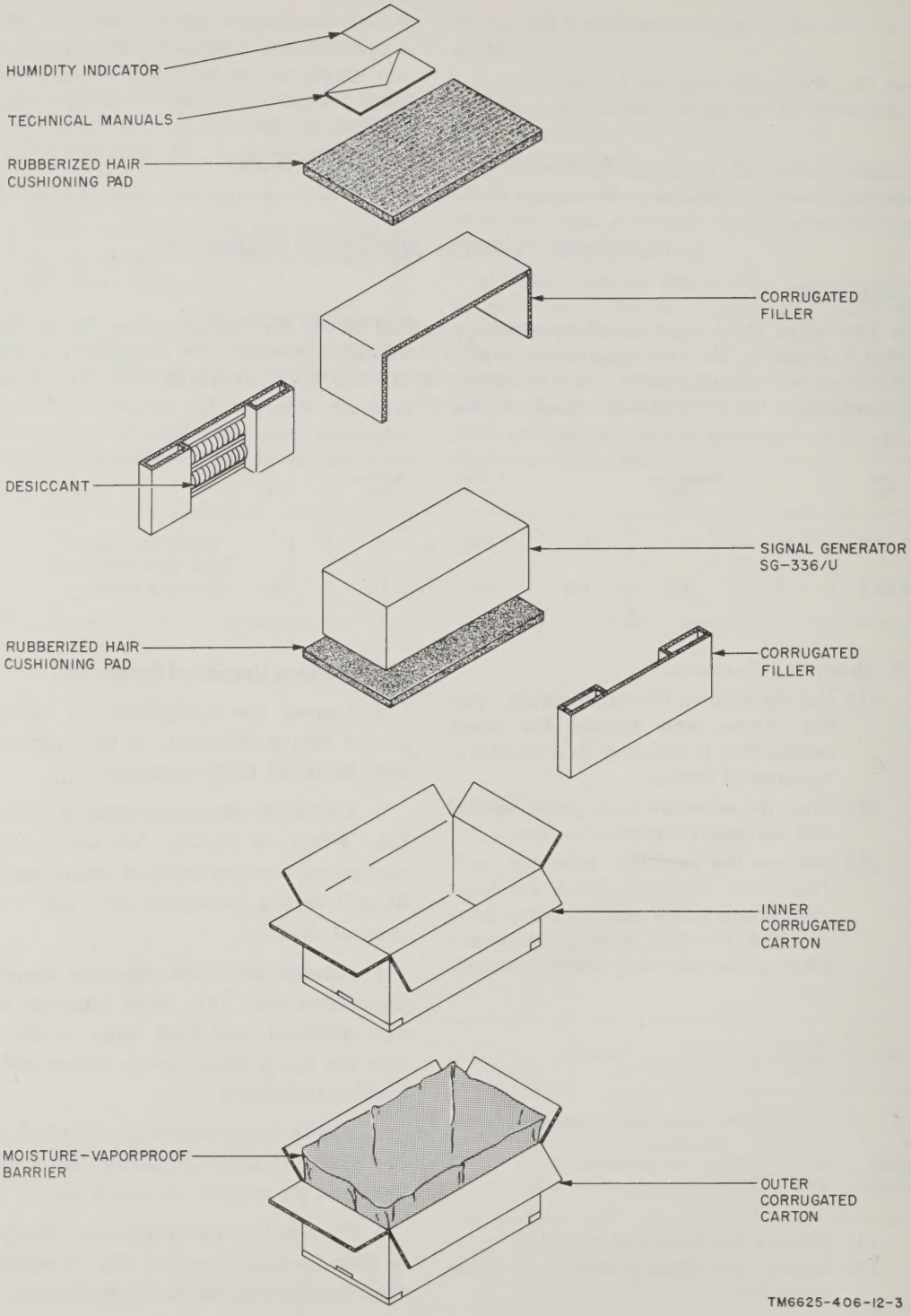

Figure 3. Typical packaging.

Operating freq (mc)	Crystal freq (mc)	Crystal socket
27.5	27.475	XY1
28.5	28.475	XY2
30.0	29.975	XY3
31.5	31.475	XY4
32.5	32.475	XY5

11. Installation (fig. 1)

a. General. The signal generator is shipped by the manufacturer with all tubes, the fuse, and the power cable attached. If the signal generator has been reshipped with the tubes removed, proceed to *b* below.

b. Installation of Tubes. Remove the tubes from their cartons and install them in the signal generator as follows:

(1) Remove the four recessed-head screws that fasten the front panel to the cabinet.

(2) Grasp the two handles and slide the signal generator out of the cabinet. Be careful to prevent strain on the power cable. Make sure that the power cable is not tangled, and that it is free to pass through the opening at the rear of the cabinet.

(3) Replace the tubes in the chassis (fig. 4).

(4) Replace the chassis in the cabinet. Align the mounting slots in the front panel with the four threaded mounting holes in the cabinet, and fasten the panel to the cabinet with the four recessed-head screws.

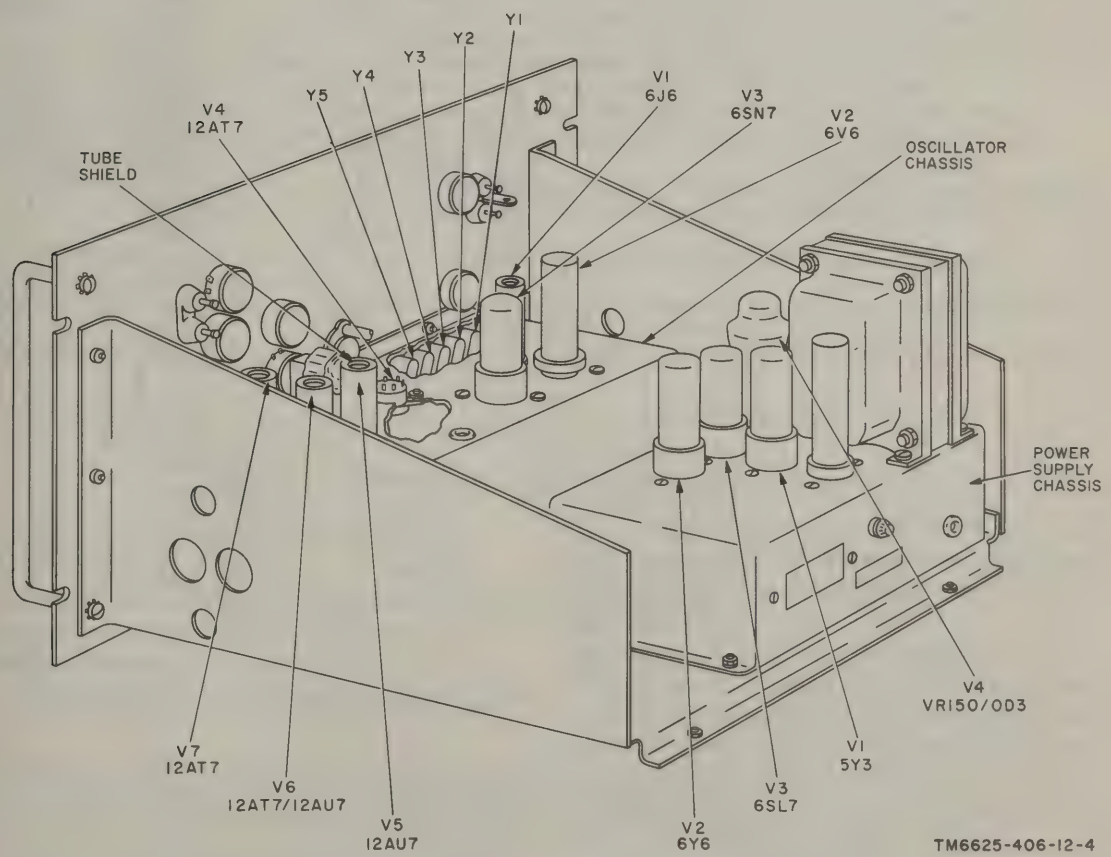

Figure 4. Signal generator, tube and crystal location.

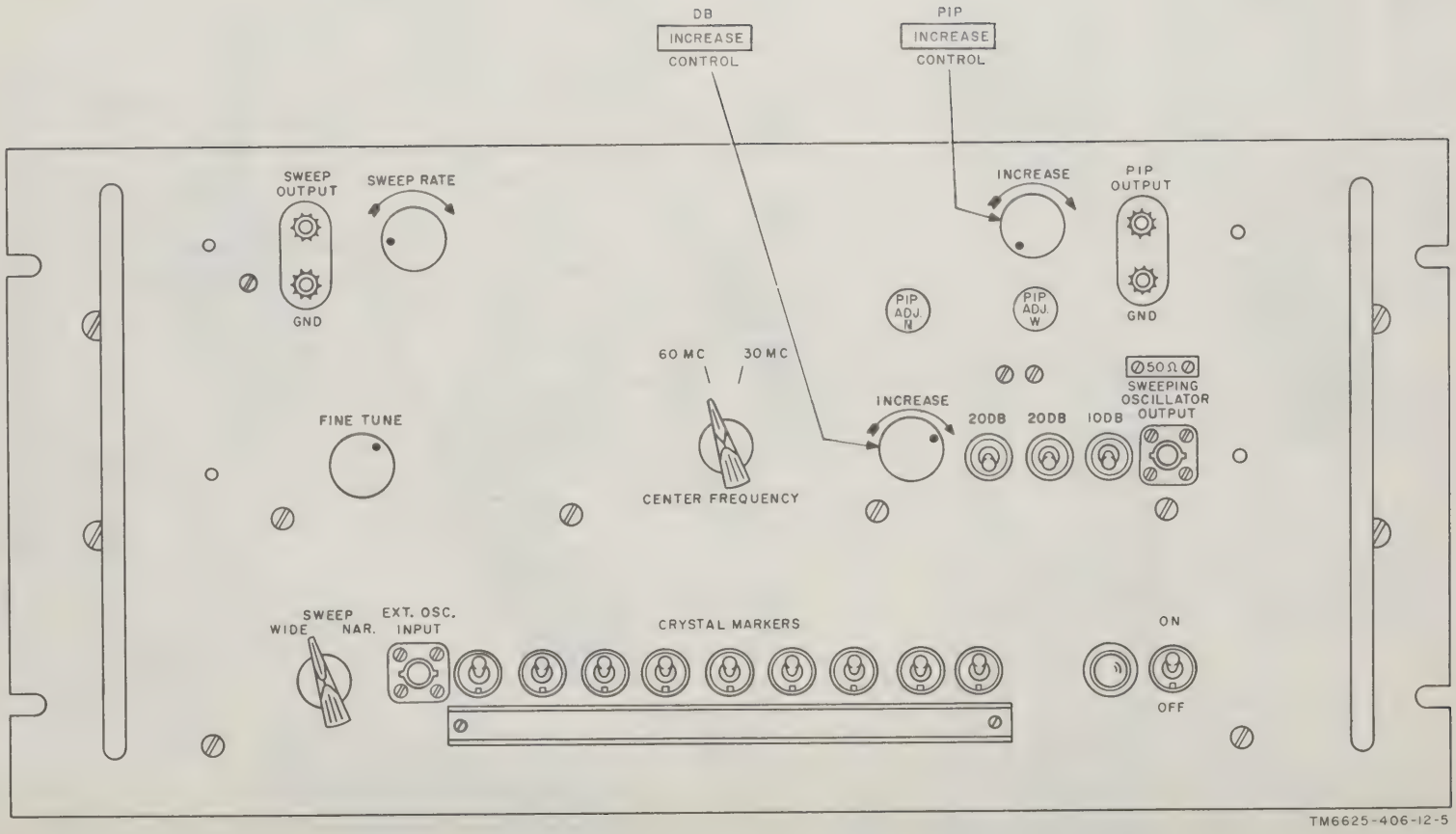

Figure 5. Signal generator, operating controls, indicators, and connectors.

12. Signal Generator SG–336/U Operator's Controls and Indicators (fig. 5)

The operating controls, indicators, and their functions are as follows:

Control or indicator	Function
POWER ON-OFF switch	Turns signal generator on and off.
Power pilot lamp	Indicates power is being applied to signal generator.
CENTER FREQUENCY control (2-position switch).	Switch position — Action 60 mc — Provides center frequency sweep output of 60 mc. 30 mc — Provides center frequency sweep output of 30 mc.
SWEEP RATE control	Adjusts repetition rate of sawtooth voltage appearing at SWEEP OUTPUT terminals. Repetition rate is normally locked in at nominal 60-cps line frequency. For special tests, SWEEP RATE control permits adjustment of repetition rate above or below 60 cps.
SWEEP switch (2-position)	Switch position — Action WIDE — Provides sweep width output of 20 mc. NAR. — Provides sweep width output of 3 mc.
FINE TUNE control	In narrow band operation, adjusts center frequency of sweeping signal.
Pip INCREASE control	Adjusts amplitude of variable and crystal-controlled markers over range of 0 to 10 volts peak to peak.
PIP ADJ. N control	Provides means of adjustment to obtain full, stable complement of markers without spurious pips when SWEEP switch is set to NAR. position. (Some interaction occurs between PIP ADJ. N and PIP ADJ. W controls.)
PIP ADJ. W control	Provides means of adjustment to obtain full, stable complement of markers without spurious pips when SWEEP switch is set to WIDE position.
CRYSTAL MARKERS (9-toggle switches).	In down position, each switch controls one of five standard or four optional crystal-controlled markers provided as frequency indicators.
PIP OUTPUT terminals	Provide means for connecting output markers to external oscilloscope.
20DB, 20DB, and 10DB (3-toggle switches).	Attenuate sweeping oscillator output voltage in corresponding fixed steps.
Db INCREASE control	Adjusts sweeping oscillator output voltage over 0- to 6-db range. May be used individually, or in any combination with 20DB, 20DB, and 10DB switches.
50Ω SWEEPING OSCILLATOR OUTPUT connector.	Connects sweeping oscillator output voltage to equipment under test.
SWEEP OUTPUT terminals	Provide means for connecting linear sawtooth sweep voltage to horizontal deflection circuits of external oscilloscope.
EXT. OSC. INPUT connector	Provides means for connecting external cw signal generator to provide variable markers.

Section II. OPERATION UNDER USUAL CONDITIONS

13. Preliminary Starting Procedure (fig. 6)

Perform the preliminary operations listed below before starting the equipment as described in paragraph 14.

a. Set the ON–OFF switch to the OFF position.

b. Connect the PIP OUTPUT terminal of the signal generator through a 47K resistor to the vertical input terminal of the external oscilloscope, and the associated GND terminal to the vertical ground terminal of the oscilloscope.

c. Connect the SWEEP OUTPUT terminal and the associated GND terminal of the signal generator to the horizontal input terminals of the oscilloscope.

d. Using Cord CG–409/U, connect the 50 Ω SWEEPING OSCILLATOR OUTPUT connector of the signal generator to the input of the equipment under test. If the input impedance of the equipment under test is not 50 ohms, the equipment literature will usually specify the impedance matching network to be used.

e. If a detector is not used, connect the output terminals of the equipment under test,

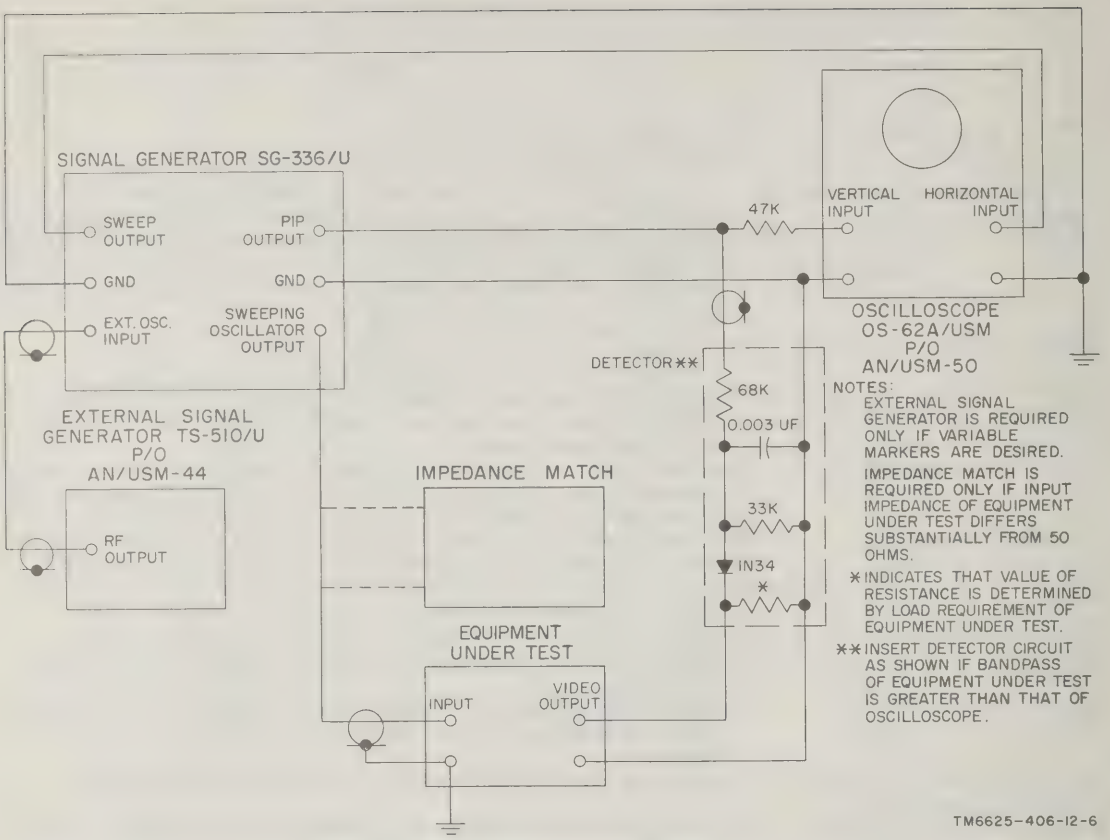

Figure 6. Typical test setup.

through a low-pass filter composed of a 47K resistor and a 0.001 μf-capacitor, to the vertical input terminals of the oscilloscope. Place the resistor in series with the connecting cable and the capacitor from the oscilloscope vertical input terminal to ground.

f. If variable markers are to be used, connect the output of an external signal generator to the E–T. OSC. INPUT connector; use Cord CG–409/U.

g. Connect the power cable of the signal generator and the power cables of the associated test equipment to a 117-volt ac source.

h. Set the ON-OFF switch to ON. Turn on the power switches of the associated test equipment. Apply power to the equipment under test.

i. Wait 5 to 10 minutes to allow the tubes to warm up and all equipment to stabilize.

14. Checking Response of Circuit Under Test

Perform the preliminary procedures described in paragraph 13 and the procedure below for checking the response of a radar intermediate frequency amplifier.

a. Set the CENTER FREQUENCY control to the position that corresponds to the intermediate frequency (60 mc or 30 mc) of the equipment under test.

b. Adjust the oscilloscope controls for an external sweep, and the brightness control for a visible trace.

c. Adjust the oscilloscope for calibrated voltage readings.

d. Using the 20DB, 20DB, and 10DB switches together with the db INCREASE control, adjust the output of the signal generator to the value specified for the equipment under test.

e. Set the SWEEP switch to the position specified for the equipment under test. For a 3-mc frequency deviation, set the switch to NAR.; for a 20-mc frequency deviation, set the switch to WIDE.

f. Adjust the oscilloscope controls until a usable response curve is obtained on the screen.

g. Adjust the SWEEP RATE control until a stable pattern is obtained on the oscilloscope screen.

h. To determine various points on the response curve, set the appropriate crystal MARKERS switches to the lower positions. One marker pip should appear on the oscilloscope pattern for each switch actuated (if a crystal is installed in the corresponding crystal socket). Adjust the PIP ADJ. W or PIP ADJ. N control to obtain the proper number of markers. Adjust the pip INCREASE control for proper marker height. When the NAR. position of the SWEEP switch is used, the response curve can be centered on one of the fixed frequency markers by the use of the FINE TUNE control.

i. If variable markers are desired, adjust the output of the external signal generator to the desired marker frequency, and at an amplitude of not less than 0.1 volt. Adjust the PIP ADJ. W control, the PIP ADJ. N control, and the pip INCREASE control as described in *h* above, if necessary.

j. Since the sweep output applied from the signal generator to the oscilloscope is linear, the horizontal baseline of the oscilloscope can be calibrated with respect to frequency. The frequency of any fixed marker is indicated beneath the corresponding CRYSTAL MARKERS switch. The display on the oscilloscope is thus a plot of the output voltage of the equipment under test versus frequency. Since the amplitude of the signal generator RF output remains constant, the variations in output voltage are due to the response characteristics of the equipment under test. To determine the bandpass of the equipment under test (if the detector used is linear), the points on the oscilloscope trace where the output voltage drops to 70.7 percent of the maximum value, and measure the frequency spread between these two points. The response curve on the oscilloscope should have the shape specified for the equipment under test, and the bandwidth should also be as specified.

15. Stopping Procedure

To shut down the equipment completely, set the ON-OFF switch to the OFF position, set the power switches on the associated test equipment to the OFF position, and disconnect the equipment from the power source.

Section III. OPERATION UNDER UNUSUAL CONDITIONS

16. Operation at Low Temperatures

Extreme variations in temperatures may affect the frequency stability of the signal generator. If possible, operate the equipment in a heated vehicle.

17. Operation Under Tropical Conditions

In tropical climates, it is possible that the equipment will be operated in swampy areas where extreme moisture conditions exist. The high relative humidity causes condensation of moisture on the equipment whenever the temperature of the equipment becomes lower than that of the surrounding air. Try to keep the signal generator dry.

18. Operation in Desert Climates

When operated in desert climates, large amounts of foreign matter may enter the signal generator. Foreign matter can adversely affect the operation of the signal generator by forming conducting paths that may cause arcing and voltage breakdown across normally nonconducting surfaces. Try to keep the equipment as clean as possible.

CHAPTER 3
MAINTENANCE INSTRUCTIONS

Section I. PREVENTIVE MAINTENANCE

19. Tools and Materials Required

The materials required for operator's and organizational maintenance of the signal generator are listed below.

a. Cleaning Compound (Federal stock No. 7930–395–9542).

b. Lint-free cloth.

c. Sandpaper, No. 000.

20. Preventive Maintenance Form (figs. 7and 8)

DA Form 11–266 is a preventive maintenance checklist to be used by the operator and organizational maintenance personnel. Items 1 through 14 are checked daily and items 5 through 11 are checked weekly by the operator. Items 12 through 28 are checked at least once a month by organizational maintenance personnel. Items not applicable to Signal Generator SG–336/U are lined out in the figures. References in the ITEM block in the figures are to paragraphs that contain additional maintenance information about the particular item. Instructions for use of the form appear on the form.

Warning: **Disconnect all power before performing preventive maintenance. After power is disconnected, some capacitors still may retain dangerous voltages. Before touching exposed electrical parts, short circuit the parts to ground. When maintenance is completed, replace the equipment in its cabinet, reconnect the power, and check for satisfactory operation.**

a. First Echelon Items (fig. 8).

Warning: **Cleaning compound is flammable and its fumes are toxic. Do not use it near a flame; provide adequate ventilation.**

Item	Maintenance procedures
1	Use a clean cloth to remove dust, dirt, moisture, and grease from the cabinet and the front panel. If necessary, wet the cloth with Cleaning Compound (Federal stock No. 79-395–9542) and then wipe all parts with a dry, lint-free clean cloth.
3	All control knobs should work smoothly, be tight on the shafts, and should not bind. Tighten all loose knobs and be sure that the knobs do not rub against the panel.
5	Repair any cuts in the cable, power, electrical, (electrical power cable) insulation by covering them with rubber tape and then with friction tape.
10	Inspect the cabinet, the front panel, and the front panel connectors for corrosion. Use cleaning compound for removing dirt. Dry with a clean lint-free cloth.

b. Second Echelon Items (fig. 8).

Item	Maintenance procedures
12	Remove the chassis from the cabinet (par. 11) and inspect all tubes (fig. 4), without removing them, for poor seating; inspect crystal units in crystal holders for firm mounting.
16	Inspect connection between power supply chassis and oscillator chassis (fig. 4) for good contacts. Inspect for loose solder connections to switches and external connectors.
19	Inspect resistors for indication of excessive heat and capacitors for bulges or splitting.

MAINTENANCE CHECK LIST FOR SIGNAL EQUIPMENT
TEST EQUIPMENT
(AR 750-625)

EQUIPMENT NOMENCLATURE

SIGNAL GENERATOR SG-336/U

EQUIPMENT SERIAL NUMBER

8

INSTRUCTIONS

This form may be used for a period of one month by using the correct dates and weeks of the month. It is to be used as a Preventive Maintenance check list for Signal equipment in actual use, or for a check on equipment prior to issue.

1. For detailed Preventive Maintenance instructions see:
   a. The Technical Manual *(in TM 11 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   b. The Supply Bulletin *(SB 11-100 series)* for the equipment. *(See DA Pamphlet Number 310-4)*
   c. The Department of the Army Lubrication Order. *(See DA Pamphlet Number 310-4)*

2. The following action will be taken by either the Communications Officer/ Chief for 1st echelon, or the Inspector for higher echelon
   a. Enter Equipment Nomenclature and Serial Number.
   b. Strike out items that do not apply to the equipment.

3. Operator/Inspector will enter in the columns entitled CONDITION, on the proper line, a notation regarding the condition, using symbols specified under LEGEND.

4. After operator completes each daily inspection he will initial over the appropriate dates under "Daily Condition for Month", then return form to his supervisor.

FOLD

TYPE OF INSPECTION

PREVENTIVE MAINTENANCE

OPER-ATOR	2/3 ECH-ELON	DATE	SIGNATURE
✓	✓	7 AUG '61	John Carr

U. S. GOVERNMENT PRINTING OFFICE 1957 O 427138

4

DA FORM 1 MAY 57 11-266

TM6625-406-12-7

Figure 7. DA Form 11-266, pages 1 and 4.

LEGEND for marking conditions:
Satisfactory, ✓
Adjustment, Repair or Replacement required, X.
Defect corrected, (X)

DAILY CONDITION FOR MONTH OF AUGUST 1961

NO	DAILY ITEM	1 17	2 18	3 19	4 20	5 21	6 22	7 23	8 24	9 25	10 26	11 27	12 28	13 29	14 30	15 31	16	2D 3D ECHELON
1	CLEAN DIRT AND MOISTURE FROM EXPOSED SURFACES OF HOUSINGS, ~~CASES, CABINETS~~, CONTROL PANELS, INTERCONNECTING PLUGS, CABLES, HEADSETS, METER WINDOWS, ETC. PARA 20	✓	✓	✓	✓	✓	✓	✓	✓									
2	INSPECT FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS SWITCHES, KNOBS, ~~JACKS~~, CONNECTORS AND PILOT LIGHTS. PARA 20	✓	✓	✓	✓	✓	✓	✓	✓									
3	INSPECT CONTROLS FOR BINDING, SCRAPING. TAP CONTROLS LIGHTLY FOR CUT-OUT DUE TO LOOSE CONTACTS. PARA 20	✓	✓	✓	✓	✓	✓	✓	✓									
4	DURING OPERATION BE ALERT FOR ANY UNUSUAL PERFORMANCE OR CONDITION.	✓	✓	✓	✓	✓	✓	✓	✓									

WEEKLY	CONDITION EACH WEEK 1ST	2D	3D	4TH	5TH	2D 3D ECH
5. INSPECT CORDS, CABLES, ~~WIRE AND SHOCK MOUNTS~~ FOR BREAKS, CUTS, KINKS, DETERIORATION, STRAIN AND FRAYING. PARA 20	✓					✓
6. ~~INSPECT CANVAS AND LEATHER ITEMS FOR FUNGUS, FRAYING, TEARS, BROKEN ZIPPERS AND SNAP FASTENERS.~~						
7. HAND CHECK FOR LOOSENESS OF EXTERIOR ITEMS SUCH AS HANDLES, ~~LATCHES, HINGES~~.	✓					✓
8. ~~INSPECT FOR LUBRICATION IN ACCORDANCE WITH APPLICABLE DA LUBRICATION ORDER.~~						
9. ~~INSPECT DRY BATTERIES FOR DIRT, LOOSE TERMINALS AND LEAKAGE.~~						
10. INSPECT EXPOSED METAL SURFACES FOR RUST AND CORROSION. PARA 20	✓					✓
11. INSPECT METERS FOR DAMAGED GLASS AND CASES.	✓					✓

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
12. INSPECT SEATING OF READILY ACCESSIBLE ITEMS OF A PLUCK-OUT NATURE: CRYSTALS, FUSES, CONNECTORS, ~~PLUG-IN COILS, LAMPS~~, ETC. DO NOT REMOVE, ROCK OR TWIST TO INSPECT. USE ONLY A DIRECT PRESSURE TO INSURE THE ITEM IS FULLY SEATED.	✓
13. ~~INSPECT FOR CLEANLINESS AND TIGHTNESS OF SUCH ITEMS AS SHOCK MOUNTS, ANTENNA, ANTENNA MOUNTS AND WAVE GUIDES.~~	
14. ~~INSPECT RELAY AND CIRCUIT BREAKER ASSEMBLIES FOR DIRT, CORROSION, WORN OR BURNED CONTACTS.~~	

ADDITIONAL ITEMS FOR 2D AND 3D ECHELON INSPECTIONS	CONDITION
15. INSPECT RESISTORS, ~~BUSHINGS~~, INSULATORS FOR CRACKS, CHIPPING, BLISTERING, DISCOLORATION AND MOISTURE.	✓
16. INSPECT JACKS AND CONNECTORS FOR SNUG FIT AND GOOD CONTACTS.	✓
17. INSPECT VARIABLE CAPACITORS FOR DIRT AND MOISTURE.	✓
18. ~~INSPECT AIR FILTERS FOR CLEANLINESS.~~	
19. INSPECT ~~SCREWTYPE TERMINALS OF TRANSFORMERS~~, FIXED CAPACITORS, RESISTORS, CHOKES, POTENTIOMETERS AND RHEOSTATS FOR CORROSION, DIRT AND LOOSE CONTACTS.	✓
20. CLEAN AND TIGHTEN SWITCHES, ~~BLOWERS, RELAY CASES~~; CLEAN INTERIOR OF CHASSIS AND CABINETS.	✓
21. ~~INSPECT GENERATORS, MOTORS AND DYNAMOTORS FOR BRUSH WEAR, SPRING TENSION, ARCING AND COMMUTATOR WEAR.~~	
22. ~~INSPECT TERMINAL BLOCKS FOR LOOSE CONNECTIONS, CRACKS AND BREAKS.~~	
23. ~~INSPECT GASKETS AND BUSHINGS FOR WEAR AND DAMAGE.~~	
24. ~~INSPECT CATHODE RAY TUBES FOR BURNED SCREEN SPOTS.~~	
25. ~~BEFORE STORING OR SHIPPING REMOVE ALL BATTERIES.~~	

IF DEFICIENCIES NOTED ARE NOT CORRECTED DURING THE INSPECTION, INDICATE ACTION TAKEN FOR CORRECTION. *(Continue on page 4, if more space is needed)*

2 3

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Figure 8. DA Form 11-266, pages 2 and 3.

Section II. TROUBLESHOOTING

21. Extent of Instructions

a. The operator's troubleshooting techniques are limited to replacing plug-in items such as tubes (except V2, V3, and V4 of the oscillator section of the signal generator), the fuse and the pilot lamp. Organizational maintenance personnel can, in addition, replace bumper, rubber, crystals, knobs, cable, power, and tube shields.

b. The troubleshooting techniques are presented in four general procedures: visual inspection, use the equipment performance checklist, tube replacement, and repairs.

Note. No lubrication is required.

22. Visual Inspection

a. Failure of the signal generator to perform properly may be caused by an easily overlooked mechanical or electrical fault. When it fails to perform properly, turn off the power and check for the possible defects listed below.

(1) Wrong setting of switches and controls (par. 12).

(2) Burned-out fuse (usually indicates some other fault (par. 25)).

(3) Poor or improper connection between signal generator and equipment under test (par. 13).

(4) Switch contacts for signs of wear and corrosion.

(5) Incorrect line voltage.

b. If the above visual inspections do not locate the trouble, proceed to the equipment performance checklist (par. 23).

23. Equipment Performance Checklist

a. General. The equipment performance checklist provides a procedure for systematically checking equipment performance. Corrective measures that the operator or organizational maintenance man can perform are given in the *Corrective measures* column. When using the checklist, start at step 1 and follow each step in order. If the corrective measures indicated do not repair the equipment, troubleshooting is required by higher echelon. Note on the repair tag how the equipment performed, and the corrective measures that were taken. Perform the steps in *d* below.

b. Observing Test Set Output. Signal Generator SG–336/U cannot be checked for proper operation without the use of other equipment, because there is no way to determine if there is a signal output. It will be necessary that an oscilloscope be used to observe the output wave shape of the equipment under test.

c. Common Name for Equipment Performance Checklist. Oscilloscope OS–62A/USM (part of AN/USM–50) is referred to as the Oscilloscope, and Signal Generator TS–510/U (part of AN/USM–44) as the external signal generator.

d. Checklist.

	Step	Action	Normal indication	Corrective measures
PREPARATORY	1	Connect the power cable of Signal Generator SG–336/U to an ac power source.		
	2	Connect the SWEEP OUTPUT terminals of Signal Generator SG–336/U to the horizontal deflection plates of the oscilloscope (par. 8).		
	3	Connect the rf output connector of the external cw signal generator (par. 8) to the EXT. OSC. INPUT connector of Signal Generator SG–336/U.		
	4	Connect the line cord of the oscilloscope and the external cw signal generator to an ac power source. Turn on the power switches of the oscilloscope and the external cw signal generator. Calibrate the horizontal deflection circuit of the oscilloscope.		
EQUIPMENT PERFORMANCE	5	Set ON-OFF switch to ON position.	Power pilot lamp lights. Horizontal trace, with length corresponding to 7 volts or more, appears on oscilloscope.	If indications are abnormal, check fuse, check pilot lamp, and check cable power to ac power source. Check tubes V1, V2, V3, and V4 in power supply chassis (par. 24). If only trace length is incorrect, check V1 of the OSC. chassis. Check tubes V5, V6, and V7 of the OSC. chassis. Higher echelon maintenance is required.
	6	Set CENTER FREQUENCY switch to 30 MC, SWEEP switch to WIDE, and five active CRYSTAL MARKERS switches to on (down) position. Adjust pip INCREASE control, PIP ADJ. W control, and vertical deflection controls of oscilloscope as required.	One marker pip appears along the oscilloscope trace for each CRYSTAL MARKERS switch actuated.	Check affected crystal. If crystal and tube replacement (pars. 24 and 25) does not correct trouble, higher echelon maintenance is required.
	7	Set CENTER FREQUENCY switch to 30 MC, SWEEP switch to NAR., and five active CRYSTAL MARKERS switches to on (down) position. Adjust pip INCREASE control, PIP ADJ. N control, and vertical deflection controls of oscilloscope as required. Vary FINE TUNE control so that the response curve is centered on the 30-MC marker.	One marker pip appears along oscilloscope trace for each CRYSTAL MARKERS switch activated.	Check tubes V5, V6, and V7 of the oscillator chassis. Check affected crystals. If crystal and tube replacement (pars. 24 and 25) do not correct trouble, higher echelon maintenance is required.

EQUIPMENT PERFORMANCE

8	Set all CRYSTAL MARKERS switches to off (up) position. Tune external signal generator over range of approximately 20 mc to 40 mc while observing oscilloscope trace.	Marker moves along oscilloscope trace as external signal generator frequency is varied. At low frequency end of oscilloscope trace, external signal generator frequency is 20 mc or lower; at high frequency end, 40 mc or higher.	Higher echelon maintenance is required.
9	Set CENTER FREQUENCY switch to 60 MC. Tune the external signal generator over range of approximately 50 mc to 70 mc.	Same as step 8, except frequency at low frequency end of trace is 50 mc or lower; at high frequency end, 70 mc or higher.	Higher echelon maintenance is required.
10	Disconnect PIP OUTPUT terminals from vertical deflection circuits of the oscilloscope. Connect 50Ω SWEEPING OSCILLATOR OUTPUT connector of Signal Generator SG–336/U through detector (fig. 6) to vertical input of the oscilloscope. Vary the setting of db INCREASE control and attenuator switches.	Height of trace on the oscilloscope decreases in discrete steps as attenuator switches are operated. Height varies continuously over limited range as setting of db INCREASE control is varied.	Higher echelon maintenance is required.
11	Set CENTER FREQUENCY switch to 30 MC Vary setting of db INCREASE control and attenuator switches.	Same as step 10.	Higher echelon maintenance is required.
12	Turn power switches on test equipment to off position. Set ON-OFF switch to OFF position Disconnect Signal Generator SG–366/U from test equipment.		

24. Tube Replacement

When trouble occurs, check the power cable connection, control settings, and wiring before removing any tubes. If tube failure is suspected, use the applicable procedure below to check the tube. Refer to paragraph 11 for chassis removal from cabinet for tube replacement.

Caution: **Do not rock or rotate a tube when removing it from a socket; pull it straight out with a tube puller. Do not remove tube V2, V3, or V4 of the oscillator section of the signal generator. Higher echelon replacement is required.**

a. Tube Substitution Method. Replace suspected tubes (*b* below) one at a time, with new tubes. If the equipment is still inoperative, remove the new tube and put back the original tube. Repeat this procedure with each suspected tube until the defective tube is located. If the signal generator is still inoperative, other checks (par. 23) are required.

b. Replacing Tubes. Replace tubes in the test set as follows:

(1) Remove the chassis from the cabinet (par. 11).
(2) Remove the tube from the socket.
(3) Replace the tube with one of the running spares.
(4) Replace the chassis in the cabinet (par. 11).

25. Repairs

a. Replacement of Fuse.

(1) Turn the cap on the fuseholder, located at the rear of the signal generator, counterclockwise and pull it out to expose the defective fuse.
(2) Pull the defective fuse out, and replace it with a new one. Push the cap of the fuseholder in, and twist it clockwise to lock it.

Caution: **If the replacement fuse also blows, higher echelon repair is required.**

b. Replacement of Pilot Lamp.

(1) Unscrew the glass indicator jewel, and remove it to expose the defective indicator lamp.
(2) Press in on the indicator lamp, and turn it counterclockwise to unlock it.
(3) Pull the defective indicator lamp out, and replace it with a new one. Push the new indicator lamp in and twist it clockwise to lock it.

c. Electrical Power Cable Repair. Repair any cuts in the electrical power cable insulation by covering them with rubber tape and then with friction tape. Replace the electrical power cable if the conductors or the plug is defective.

d. Replacement of Crystals.

(1) Remove the four recessed-head (fig. 1) screws that secure the front panel of the signal generator to the cabinet, and slide the signal generator out of the cabinet (par. 11).
(2) Remove four screws from the bottom shield of the frequency generating chassis.
(3) Remove the bottom shield.
(4) Remove the defective crystal from its socket (fig. 4).
(5) Insert a replacement crystal of the correct frequency (par. 10) in the crystal socket.
(6) Replace the four screws on the bottom shield of the frequency-generating chassis, slide the signal generator back into its cabinet, and insert and tighten the four recessed-head screws that secure the front panel of the signal generator to the cabinet.

CHAPTER 4

SHIPMENT, LIMITED STORAGE, AND DEMOLITION TO PREVENT ENEMY USE

Section I. SHIPMENT AND LIMITED STORAGE

26. Disassembly of Equipment

No disassembly of the signal generator is required for shipment or storage. The equipment is packed with tubes, the fuse, and crystals mounted in place.

27. Repackaging for Shipment or Limited Storage

The exact procedure for repackaging depends on the material available and the conditions under which the equipment is to be shipped or stored. Adapt the procedures outlined below whenever circumstances permit. The information concerning the original packaging (par. 9) will also be helpful.

a. Material Requirements. The following materials are required for packaging the signal generator. For stock numbers of materials, consult SB 38–100.

Material	Quantity
Corrugated fiberboard	60 sq ft
Waterproof-vaporproof barrier material	24 sq ft
Filler material, 1 inch thick	5 sq ft
Tape, waterproof, pressure sensitive	20 ft
Desiccant	36 unit
Humidity indicator	1

b. Packaging.

(1) *Technical manuals.* Package the technical manuals within a close-fitting bag fabricated of waterproof wrapping paper. Seal the seams with pressure-sensitive tape.

(2) *Spare parts.* (To be shipped separately). Wrap each of the spare parts within a layer of flexible corrugated fiberboard. Seal the seams with pressure-sensitive tape. Overwrap the flexible corrugated fiberboard with water-vaporproof barrier material and seal (*i* below). Place in corrugated carton and seal with waterproof pressure-sensitive tape.

(3) *Signal generator.*

(*a*) Place a pad of filler material in the bottom of a corrugated cardboard carton.

(*b*) Place the signal generator on the filler material.

(*c*) Place a pad of filler material on the top of the signal generator.

(*d*) Cushion the signal generator with cells of corrugated fiberboard on all sides.

(*e*) Place the required amount of desiccant within the carton.

(*f*) Place the technical manuals on top of the signal generator.

(*g*) Seal the carton with waterproof pressure-sensitive tape.

(*h*) Place the sealed carton within a fabricated water-vaporproof barrier material.

(*i*) Place a humidity indicator card on top of the sealed interior carton, and fasten it with tape.

(*j*) Heat-seal the water-vaporproof fabricated bag; leave a small opening to exhaust the air.

(*k*) Evacuate the excess air from the water-vaporproof fabricated bag, and complete the heat seal.

(*l*) Place the moisture-vaporproofed signal generator and technical manuals within a closefitting corrugated cardboard carton.

(*m*) Seal the carton with waterproof pressure-sensitive tape.

Section II. DEMOLITION OF MATERIEL TO PREVENT ENEMY USE

28. Authority for Demolition

The demolition procedures given in paragraph 29 will be used to prevent the enemy from using or salvaging this equipment. Demolition of the equipment will be accomplished only upon the order of the commander.

29. Methods of Destruction

Any or all of the methods of destruction given below may be used. The time available will be the major determining factor for the methods to be used in most instances when destruction of equipment is undertaken. The tactical situation also will determine in what manner the destruction order will be carried out. In most cases, it is preferable to demolish completely some portions of the equipment rather than to partially destroy all the equipment.

a. Smash. Use sledges, axes, hammers, crowbars, and any other heavy tools available to smash the signal generator.

(1) Use the heaviest tool on hand to smash the front panel knobs and controls.

(2) Remove the signal generator from its cabinet. Remove the shields from the frequency-generating chassis. With a heavy hammer or bar, smash as many as possible of the exposed parts of the two chassis. Be sure to smash all crystals.

b. Cut. Use axes, handaxes, machetes, and similar tools to cut cabling and wiring. Use a heavy axe or machete to cut the power cable in a number of places. If time permits, remove the unit from its cabinet, remove the internal shields, and slash the internal cabling and wiring.

c. Burn. Burn as much of the equipment as is flammable; use gasoline, oil, flamethrowers, and similar tools. Burn the instruction literature first. Pour gasoline on the cut cables and internal wiring, and ignite it. Use a flamethrower to burn spare parts, or pour gasoline on the spares and ignite them. Use incendiary grenades to complete the destruction of the interior of the signal generator.

***Warning:* Be extremely careful with explosives and incendiary devices. Use these items only when the need is urgent.**

d. Explode. Use explosives to complete demolition or to cause maximum damage, before burning, when time does not permit complete demolition by other means. Powder charges, fragmentation grenades, or incendiary grenades may be used. Incendiary grenades usually are most effective if destruction of small parts and wiring is desired. For quick destruction of the signal generator, place an incendiary or fragmentation grenade in the unit. Get away from the unit after the grenade is placed.

e. Dispose. Bury or scatter destroyed parts or throw them into nearby waterways. This is particularly important if a number of parts have not been completely destroyed.

APPENDIX I
REFERENCES

The following applicable references are available to the operator or organizational maintenance personnel of Signal Generator SG–336/U.

SB 38–100	Preservation, Packaging, and Packing Materials, Supplies, and Equipment Used by the Army.
TM 11–5129	Oscilloscopes AN/USM–50A, B, and C.

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. The maintenance allocation chart assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(*a*) *Service.* To clean, to preserve, and to replenish fuel and lubricants.

(*b*) *Adjust.* To regulate periodically to prevent malfunction.

(*c*) *Inspect.* To verify serviceability and to detect incipient electrical or mechanical failure by scrutiny.

(*d*) *Test.* To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc.

(*e*) *Repair.* To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(*f*) *Align.* To adjust two or more components of an electrical system so that their functions are properly synchronized.

(*g*) *Calibrate.* To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(*h*) *Rebuild.* To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements using original manufacturing tolerances and/or specifications and subsequent reassembly of the item.

(3) *1st, 2d, 3d, 4th, and 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Not used.

c. Columns in the section allocating tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to

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perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, and 5th echelon.* The dagger (†) indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

(4) *Remarks.* Not used.

2. Mounting Hardware

The basic entries of the maintenance allocation chart do not include mounting hardware such as screws, nuts, bolts, washers, brackets, clamps, etc.

3. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to theater headquarters or communication zones, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

Section II. MAINTENANCE ALLOCATION CHART

Part or component	Maintenance function (2)	1st ech (3)	2d ech (4)	3d ech (5)	4th ech (6)	5th ech (7)	Tools required (8)	Remarks (9)
SIGNAL GENERATOR SG-336/U.	service	X					1	
	adjust				X		1, 2, 3, 4, 6, 7, 9	
	inspect	X					1	
	replace							
	repair				X		1, 2, 3, 4, 6, 7, 9	
	align				X		1, 2, 3, 4, 7	
	calibrate				X		1, 2, 3, 4, 7	
	rebuild					X	1, 2, 3, 4, 5, 7, 8, 9	
POWER SUPPLY SUBASSEMBLY.	service	X					1	
	adjust				X		1, 2, 3, 4, 6, 7, 9	
	inspect	X					1	
	replace				X		7	
	repair				X		1, 2, 3, 4, 6, 7, 9	
	align				X		1, 2, 3, 4, 7	
	calibrate				X		1, 2, 3, 4, 7	
	rebuild					X	1, 2, 3, 4, 5, 7, 8, 9	

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

Tools required for maintenance functions	1st ech (2)	2d ech (3)	3d ech (4)	4th ech (5)	5th ech (6)	Tool code (7)	Remarks (8)
FREQUENCY METER AN/URM-80				X	X	1	
MULTIMETER TS-352/U				X	X	2	
OSCILLOSCOPE AN/USM-50				X	X	3	
SIGNAL GENERATOR AN/USM-44				X	X	4	
TEST SET, ELECTRON TUBE TV-2/U					X	5	
TEST SET, ELECTRON TUBE TV-7/U				X		6	
TOOL KIT TK-87/U				X	X	7	
TOOL KIT TK-88/U					X	8	
VOLTMETER, METER ME-30/U				X	X	9	
TOOLS AND TEST EQUIPMENT AVAILABLE TO THE REPAIRMAN USER BECAUSE OF HIS ASSIGNED MISSION	X					10	

APPENDIX III
BASIC ISSUE ITEMS LIST

Section I. INTRODUCTION

1. General

This appendix lists items supplied for initial operation and for running spares. The list includes tools, accessories, parts, and material issued as part of the major end item. The list includes all items authorized for basic operator maintenance of the equipment. End items of equipment are issued on the basis of allowances prescribed in equipment authorization tables and other documents that are a basis for requisitioning.

2. Columns

a. Source, Maintenance, and Recoverability Code. Not used.

b. Federal Stock Number. This column lists the 11-digit Federal stock number. In the absence of a Federal stock number, an interim number, for example L1Se61–41, indicates that a Federal stock number is being processed for assignment. The L number may be used in emergencies to identify items.

c. Designation by Model. Not used.

d. Description. Nomenclature or the standard item name and brief identifying data for each item are listed in this column. When requisitioning, enter the nomenclature and description.

e. Unit of Issue. The unit of issue is the supply term by which the individual item is counted for procurement, storage, requisitioning, allowances, and issue purposes.

f. Expendability. Nonexpendable items are indicated by NX.

g. Quantity Authorized. Under "Items Comprising an Operable Equipment," the column lists the quantity of items supplied for the initial operation of the equipment. Under "Running Spares and Accessory Items," the quantities listed are those issued initially with the equipment as spare parts. The quantities are authorized to be kept on hand by the operator for maintenance of the equipment.

h. Illustrations. The "Item No." column lists the reference symbols used for identification of the items in the illustration and text of the manual. Tubes, fuses, and lamps are illustrated in figure 2.

Section II. FIRST ECHELON FUNCTIONAL PARTS LIST

Source maintenance and recoverability code (1)	Federal stock No. (2)	Designation by model (3)	Description (4)	Unit of issue (5)	Expendability (6)	Quantity authorized (7)	Illustration	
							Figure No. (8)	Item No. (9)
			ITEMS COMPRISING AN OPERABLE EQUIPMENT					
			SIGNAL GENERATOR SG–336/U					
	6625–897–8813		SIGNAL GENERATOR SG–336/U	ea	NX			
	Order through AGC		Technical Manual TM 11–6625–406–12	ea	X	2		
			RUNNING SPARES AND ACCESSORY ITEMS					
			SIGNAL GENERATOR SG–336/U					
	5960–188–8603		ELECTRON TUBE: MIL TYPE 5Y3	ea	X	1		V1
	5960–114–3808		ELECTRON TUBE: MIL TYPE 6Y6G	ea	X	1		V2
	5960–235–9106		ELECTRON TUBE: MIL TYPE 6SL7GT	ea	X	1		V3
	5960–188–8573		ELECTRON TUBE: MIL TYPE OD3	ea	X	1		V4
	5920–295–9527		FUSE CARTRIDGE: BUSSMAN TYPE AGC3	ea	X	5		F1
	5960–188–3967		ELECTRON TUBE: MIL TYPE 6J6	ea	X	1		V1
	5960–100–5893		ELECTRON TUBE: MIL TYPE 6V6	ea	X	1		V2
	5960–188–3577		ELECTRON TUBE: MIL TYPE 6SN7GT	ea	X	1		V3
	5960–166–7662		ELECTRON TUBE: MIL TYPE 12AT7	ea	X	3		V4, V7
	5960–166–7663		ELECTRON TUBE: MIL TYPE 12AU7	ea	X	3		V5, V6
	6240–057–2887		LAMP, INCANDESCENT: GE NO. 44	ea	X	1		I1
	L1Se61–41		CRYSTAL UNIT, QUARTZ: 27.5 mc	ea	X	1		Y1
	L1Se61–42		CRYSTAL UNIT, QUARTZ: 28.5 mc	ea	X	1		Y2
	L1Se61–43		CRYSTAL UNIT, QUARTZ: 30.0 mc	ea	X	1		Y3
	L1Se61–44		CRYSTAL UNIT, QUARTZ: 31.5 mc	ea	X	1		Y4
	L1Se61–45		CRYSTAL UNIT, QUARTZ: 32.5 mc	ea	X	1		Y5

By Order of the Secretary of the Army:

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Chief of Staff.

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USATC Armor (2)
USATC Engr (2)
USATC FA (2)
USATC Inf (2)
USAOMC (3)
Svc Colleges (2)
Br Svc Sch (2)
GENDEP (2) except
Atlanta GENDEP (None)
Sig Sec, GENDEP (5)
Sig Dep (12)
WRAMC (1)
USA Trans Tml Comd (1)
Army Tml (1)
POE (1)
OSA (1)
USAEPG (2)
AFIP (1)
AMS (1)
Army Pictorial Cen (2)
EMC (1)
Yuma Test Sta (2)
USACA (3)
USASSA (20)
USASSAMRO (1)
USASEA (1)
USA Caribbean Sig Agcy (1)
USA Sig Msl Spt Agcy (13)
Sig Fld Maint Shops (3)
USA Corps (3)
JBUSMC (2)
AFSSC (1)
Units org under fol TOE:
(2 cy each UNOINDC)
11–7
11–16
11–57
11–98
11–117
11–155
11–500 (AA–AE, RA–RT) (4)
11–557
11–587
11–592
11–597

NG: State AG (3); units—same as Active Army except allowance is one copy to each unit.

USAR: None.

For explanation of abbreviations used, see AR 320–50.

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